Chapter 13
Planning Documents

Introduction

The project plans are the heart of the project management control process. They document the scope, schedule, resources, assumptions, risks and milestones that the Project Manager is committed to delivering.

Approval of the project plans is done by all the key stakeholders.

Definition of a Good Software Development Plan

The term "software development plan" refers to the overall plan for managing the software project. Managerial and technical methods and procedures to be used during the life of the project are identified. Multiple documents can be used to describe this plan.

A good SDP (software development plan) has tasks that are independent, cohesive, and well designed to facilitate ease of control. The SDP is a "living" document which is kept current throughout the project.

In This Chapter

This chapter contains the templates and guidelines for the planning documents used by the United States Customs Service for software development planning.

Section A
Deliverable Overviews

Introduction

The software development plan for a project shows all the activities, methods and technologies, baselined software work products, standards and procedures, organizational responsibilities, and phases of the project.

The software development plan at Customs consists of all the component plans described in this section. In addition, the planning and approval documents required by the Investment Management Process and references to guidance for their preparation can be found in Part II, Chapter 6, *Project Initiation*.

Note

As noted in Chapter 12, *SDLC Deliverable Summary Tables*, Class 1 and 2 projects will need to develop all of the plans defined in this Chapter. These large projects may also need to create additional plans as defined by the project in its development activities (e.g., Implementation Plan, Release Plan, Design Concept, System Architecture, etc.).

Smaller projects may provide some of this information (e.g., QA strategies) within the Project Plan instead of creating a separate document. Examples of this can be found in Part I, Chapter 1, Section C, *Tailoring Guidelines*.

Project Plan

This document describes the approach to be taken for the project, including:

- The work to be done, including
  - Software and documentation to be produced
  - Reviews and support activities to be performed
- Risks involved and strategies for mitigation
- Resources required
- Methods to be used
- The timeframe to be met
- The project's organizational structure
- Management and oversight strategies

Continued on next page

Deliverable Overviews, Continued

Data Management Plan	This document provides details on what management activities and responsibilities should be addressed for data during the system life cycle.
Configuration Management Plan	This defines the mechanisms the project will use to: • Identify the project's configuration items (e.g., hardware, software, documentation) • Control changes to the configuration items during development and testing • Provide project-wide visibility into configuration baselines and provide a method to make changes to the established baselines • Maintain integrity and traceability of configuration items.
Quality Assurance Plan	This document specifies the strategies, procedures, staff and organizational responsibilities, and schedule for activities that will be performed to provide visibility into both the quality of the products being built and the processes used by the project.
System Test Plan	This defines the planned activities, test data, and acceptance criteria for testing the delivered system. This plan is based on the user acceptance criteria initially defined in the User Requirements and the complete system requirements as refined and agreed upon in the Functional Requirements.
Training Plan	This describes the functional training needs and requirements to instruct users and support staff on the system features, modifications, and enhancements. It also describes the training methodology to be used to ensure that all employees involved are aware of their duties and responsibilities under the requirements security directives including the Computer Security Act and the Privacy Act.

Section B
Project Plan

Introduction

The project plan is the summary document that puts all cost, schedule and resource information into one location. It also provides information on the management techniques and methodologies to be used on the project (or provides references to other appropriate documents/plans).

Responsibility

The Project Manager is responsible for the creation and maintenance of the Project Plan.

The Project Initiation Team and/or System Development Team may assist in its construction/revision (depending on the life cycle phase).

The Business Sponsor, in consultation with OIT Senior Management, is responsible for final content approval prior to the overall project approval and funding decision.

In This Section

PROJECT PLAN

Project Name:		Project Number:	
Date Prepared:	Date Updated:	Date Presented:	Date Approved:

1.0 Introduction

1.1 Project Description

1.2 Project Background

1.2.1 Project Development Strategy
1.2.2 Assumptions, Dependencies, and Constraints
1.2.3 Organization of the Project Plan

1.3 Points of Contact

1.4 Project References

1.5 Glossary

2.0 Project Organization and Responsibilities

2.1 Organizational Roles and Responsibilities

2.2 Team Structure(s) and Responsibilities

2.3 Status Reporting

2.4 Risk Management Strategies

2.5 Project Quality Assurance Strategy

2.6 Configuration Management Strategy

Continued on next page

PROJECT PLAN, Continued

3.0 Work Breakdown Structures

3.1 Summary Work Breakdown Structure

3.2 Project Work Breakdown Structure

3.3 Contract Work Breakdown Structure

4.0 Task Descriptions, Schedule, and Resources

4.1 Project Summary

- 4.1.1 Target Completion Date
- 4.1.2 Total Staff Months
- 4.1.3 Total Budget
- 4.1.4 Project/Task Interdependencies

4.2 Required Facilities

4.3 Task Management

4.4 Technology Applications

4.5 Resource Acquisition Strategy

4.6 Staffing Impact Strategy

4.7 Phase Related Requirements

- 4.7.1 Detailed Work Estimates
- 4.7.2 Development Activity Tailoring
- 4.7.3 List of Required Deliverables
- 4.7.4 Quality Assurance Activities
- 4.7.5 Privacy Issues
- 4.7.6 Computer Security Activities

Continued on next page

PROJECT PLAN, Continued

5.0 Risk Areas and Mitigation Strategies

5.1 Develop a List of Risks to the Successful Completion of the Project

5.2 Assign a Priority to Each Risk Item

5.3 Estimate the Probable Cost of the Risk

5.4 Describe the Avoidance or Minimization Activities for Each Risk

Project Planning Guidelines

Introduction

These Project Planning Guidelines provide directions on how to develop all of the required elements of the Project Plan. The activities that first develop the information included in this plan are discussed in Chapter 3, *Project Control Processes*, and Chapter 6, *Project Initiation*.

In This Section

1.0 Project Plan Introduction

Key Elements of Section 1.0

This section provides a description of the project plan's purpose and scope. The following topics must be included:

Topic	Instructions
1.1 Project Description	Describe the project with adequate detail to understand the nature of the project.
1.2 Project Background	Briefly describe • why the project is important to the organization, • its mission, and • the capabilities the project will provide to the organization. Include background information or history that is important to understand how the project requirement evolved.
1.2.1 Project Development Strategy	Provide an overview of the life cycle and development methodology strategy(s) selected for the project. **Example**: The strategy might include prototyping of the system, use of commercial off-the-shelf software, conversion of an existing system from one hardware and software family to another, and so on.
1.2.2 Project Assumptions, Dependencies, and Constraints	State: • The assumptions both on which the project is based and on which the planning estimates are based • The priorities for management activities during the project • The external events the project is dependent upon • The constraints under which the project is to be conducted.
1.2.3 Organization of the Project Plan	Describe how this project plan is organized.

Continued on next page

1.0 Project Plan Introduction, Continued

Key Elements of Section 1.0 (continued)

Topic	Instructions
1.3 Points of Contact	Identify by name and organization the key points of contact for the project including: • The business sponsor for the project • The OIT manager • Other key points of contact **Note:** Ideas for additional key organizational points of contact can be developed by reviewing the Functional Impact Areas Checklist in Chapter 17, *Process and Control Documents*.
1.4 Project References	Provide a bibliography of key project references and relevant plans and deliverables produced prior to this point. **Examples:** • Cost-benefit analyses • Existing agency documentation describing internal processes • Existing documentation of the system if the project is a conversion **Note:** This list should be updated (along with the project assumptions and other textual parts of this plan) whenever the plan is rebaselined.
1.5 Glossary	Provide a glossary of terms and abbreviations used in the plan. This may be placed in an appendix to this plan.

2.0 Project Organization and Responsibilities

Definitions

Organizational Unit: This is a named collection of people or smaller organizational units used to structure the enterprise or an external body that deals with the enterprise.

Organizational Structure: The structure defines the relationships between organizational units and the roles or functions they are assigned.

Organizational Role: This is a type of position or functional activity that can be allocated to a person or an organizational unit. It defines the kind of job done, often in terms of its involvement in business activities.

Stakeholder: Someone who has a vested interest in the outcome of a project. Someone who could be impacted by the outcome of a project.

- **Internal:** The individuals who work in a functional area within the United States Customs Service and depend on a specific system for all or part of their mission critical activities.
- **External:** Users outside of the United States Customs Service who depend on Customs data collection and data processing for all or part of their business activities.

Example: The outcome of a project may affect the way an employee does his or her work. In the case of brokers, it may affect the service they receive from Customs, or the success of their business.

Types of Roles (R, A, E, W)

Responsibility: The organizational unit or individual is held accountable by management for performing the activity.

Authority: The organizational unit or individual who has the power to to make decisions about the performance of the activity.

Expertise: The organizational unit or individual who provides knowledge, experience, and the identifying rules for accomplishing an activity.

Work: The organizational unit or individual that will actually perform the activity.

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2.0 Project Organization and Responsibilities, Continued

Key Elements of Section 2.0

This section provides an overview of the organizational structures and management methodologies to be used on the project, and identifies staff responsibilities for key project roles.

Topic	Instructions
2.1 Organizational Roles and Responsibilities	Describe the organizational units, the organizational structure, and the organizational roles which affect the project. Include all agency/OIT organizations and staff titles, roles, and project-related responsibilities involved. **Note:** In describing the organizational units, structure, and roles, ensure you address all of the following information: • Provide a description of project-related organizations: ▸ Who is the business sponsor for the project? ▸ Who is the manager responsible for day-to-day administration of the project? ▸ Identify other agencies that may be involved in the project and explain their roles and responsibilities. ▸ Identify the organization(s) which perform(s) quality assurance for the project. ▸ Identify the organization(s) which perform(s) configuration management for the project. • Provide a description of the stakeholders outside the project and the customer. • Define the organizational boundaries and interfaces for the project. Review the Functional Impact Areas Checklist in Chapter 17, *Process and Control Documents* for additional relationships to be included. **Suggestion:** This information can be presented in a tabular format if desired. The Organization Roles can optionally be coded as R = Responsibility, A = Authority, E = Expertise, and W = Work.

Continued on next page

2.0 Project Organization and Responsibilities, Continued

Key Elements of Section 2.0 (continued)

Topic	Instructions
2.2 Team Structure and Responsibilities	Develop a line organization chart. Describe project team structure(s), reporting channels, responsibilities and relationships, authority, expertise, and work. Refer to Chapter 2, Section B, *Teams and Roles*, for suggestions.
2.3 Status Reporting	Describe guidelines for status reporting internally within the agency and externally for any contractor support. Refer to Chapter 4, *Project Oversight Processes*.
2.4 Risk Management Strategies	Describe how the project will control risks and who is responsible for these activities. Refer to Chapter 5, *Risk Management Process*es, for activity details. Identify: • The procedures to be used on the project to manage risks and perform risk management process activities • The relationships of these activities to other project management activities • Any mechanisms or tools to be used to maintain risk information • The personnel assigned responsibility to perform these activities.
2.5 Project Quality Assurance Strategy	Describe the methodology that will be used to ensure quality on the project and who is responsible for these activities. For larger projects, an optional QA Plan can be developed and referenced here (see Section E for details on information to be included).
2.6 Configuration Management Strategy	Describe the methodology that will be used to ensure configuration control on the project and who is responsible for these activities. Discussion should include methods and responsibilities for baselining and controlling software, hardware, and documentation as appropriate. On larger projects, a CM Plan will be developed and referenced here (see Section D for information to be included).

3.0 Work Breakdown Structures (WBS)

Introduction

The WBS is the first major step in project planning and provides the framework for estimating, budgeting, pricing, controlling costs, assigning responsibility, scheduling, allocating resources, reporting, monitoring, and controlling.

Definition

The WBS is a top-down definition in chart or table form, which represents a hierarchial decomposition of ***all*** work to be done in a project. It displays and defines the products to be developed or produced, and relates the elements of work (tasks) to be accomplished to each other and to the end product(s).

A WBS is typically displayed graphically as a tree chart, but can also be displayed in an outline format. If displayed as a table, the task description and estimates of the level of effort required to complete each task may also be included in this section.

WBS Purpose

A WBS serves the following purposes during the planning process:

- Identify completely the project work elements (i.e., tasks) that must be accomplished to achieve the project goal.
- Roll up detail activity information such as schedule, cost, and resource usage.
- Substantiate the total size estimate.

Note: The more detailed the WBS, the more accurate the product estimates, the better the project plan, and the more precisely it can be tracked.

Levels for a WBS

The WBS for a project contains multiple levels of increasingly detailed information. A common structure for a work breakdown structure is:

- Level 1 - Project
- Level 2 - Key Objectives and Milestones / Phases
- Level 3 - Activities
- Level 4 - Tasks

Continued on next page

3.0 Work Breakdown Structures (WBS), Continued

Three Types of WBSs

There are three different types of work breakdown structures. Class 1 and Class 2 projects in Customs will typically need to develop all three types of WBSs.

Type of WBS	Definition/Function
3.1 Summary Work Breakdown Structure	The Summary WBS is a high-level WBS that covers the first 3 levels of the Project WBS. • It is used for management presentation but is not used for detailed day-to-day project management. • The structure of the Summary WBS may vary depending on the nature of the project.
3.2 Project Work Breakdown Structure	The Project WBS is a detailed WBS that is used for the day-to-day management of a project. • It includes all important products and work elements, or tasks of the project, regardless of whether these tasks are performed by the agency or a contractor. It may be modified, if necessary, during the life cycle. • For a software development project, the structure of the Project WBS should also reflect the selected agency life cycle approach. • The structure of the Project WBS may vary depending on the nature of the project, and should be customized by the agency project manager to reflect the particular project and the particular path through the life cycle.

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3.0 Work Breakdown Structures (WBS), Continued

Types of WBSs (continued)

Type of WBS	Definition/Function
3.2 Project Work Breakdown Structure (continued)	**Example:** A full scale software development project and a software conversion process would be expected to have somewhat different WBSs. Similarly, the Project WBS for an information system development project (class 1 or 2) requiring major hardware would differ from a software-only project.
3.3 Contract Work Breakdown Structure (CWBS)	This is a further breakdown of the contract-specific WBS. It covers the products and work elements, or tasks, from the Project WBS that must be performed by the contractor. This section is optional if it is identical to the Project WBS. **Note:** In addition to items derived from the Project WBS, the CWBS will often have contractor-specific items which may not be reflected in the Project WBS. • Depending on the nature of the project, the contractor may be responsible for the entire development process, or only for a specified part of the development activities, e.g. quality assurance for a specific part of the development life cycle (for example, requirements definition). • A preliminary CWBS is usually specified by the agency in the Acquisition Plan or Statement of Work. The contract line items, configuration items, contract work statement tasks, contract specifications, and the contractor's responses will typically be expressed in terms of the preliminary CWBS.

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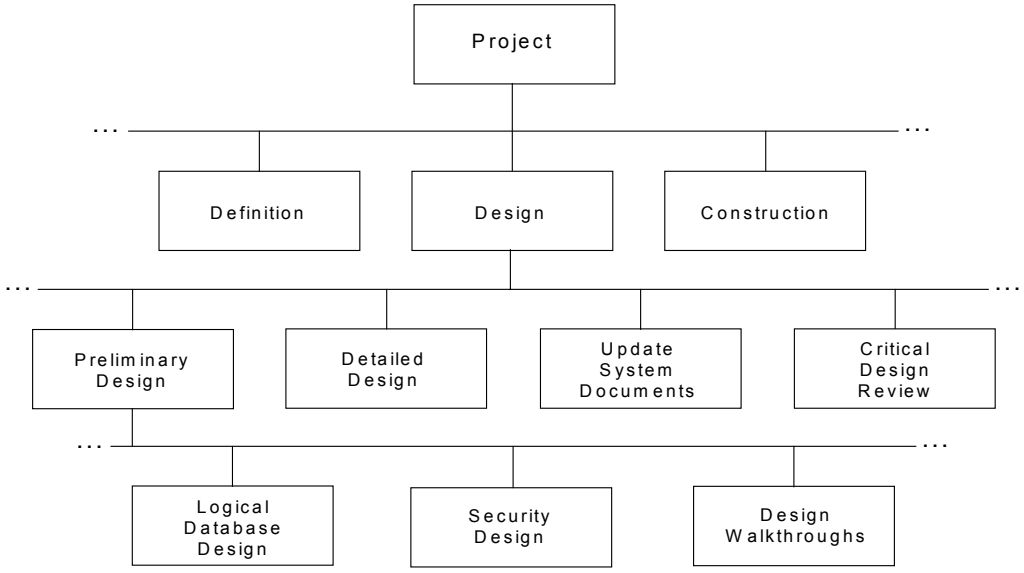
3.0 Work Breakdown Structures (WBS), Continued

WBS Example

The following graphic illustrates a WBS hierarchy:



Suggestions for Creating WBSs

- Structure the Project WBS so that the work is manageable, independent, and measurable (in terms of progress), and so that it can be integrated.
- On large projects, the Project or Program Manager may define a WBS that has lower level, smaller but related projects. Each of those sub-projects is assigned to project managers or team leads who then develop their own Project WBS for day-to-day management. These lower-level Project WBSs can then be consolidated into a high-level Project Plan WBS.
- Define the sub-projects to be as independent as possible to minimize the complexity and risk of the development process.

  Note: When this is not possible, it then becomes the upper manager's responsibility to establish periodic reviews paying close attention to the dependencies between projects and sub-projects.
- All activities and tasks must have a measurable end.

4.0 Task Descriptions, Schedule, and References

Introduction

This section defines the planned key milestones, resources, costs, deliverables, and detailed schedule estimates for the identified activities and tasks.

Definitions

Task: Generically, a task is *a defined unit of work* for one or more persons on a project. A task should have a measurable end. It is commonly used to describe a significant activity which is decomposed at another level. For example, the following task list could be created as part of Project Definition.

Example of a task list:

- Set the project scope
- Establish the Project Organization
- Build the Project Plan
- Review the Project Plan

Milestone: A milestone represents a significant point in the project. In itself it has no duration; it represents the start and/or completion of a specific portion of work. At the most detailed level, every task begins and ends with milestones.

General Instructions

Customs SDLC table of activities for the complete life cycle is organized by phases. For each phase there are a number of software development activities. List all activities that will be completed for the specific project.

Example: See the Phase Summary Table in Chapter 12.

For each activity, there will be tasks and perhaps subtasks to be completed. If possible, use diagrams and tables (automated tools) to list the tasks and show any relationships among them.

A graphic presentation should be presented for the schedule information if possible; where required, this can be included and referenced as an appendix for ease of maintenance.

Continued on next page

4.0 Task Descriptions, Schedule, and References, Continued

4.1 Project Summary

The information in this section can be presented either as a narrative or within a tabular format:

Topic	Instructions
4.1.1 Target Completion Date	Provide the target or actual completion date for the project and for each phase. As a phase is complete, its actual date is substituted for the target date and the remaining completion dates are adjusted to reflect current priorities and resources. Plan/Schedule Baselines are established at specific milestones to track slippage for auditing and reporting purposes.
4.1.2 Total Staff Months	Provide the estimated and actual staff months of effort for each phase. Divide the staff months into general schedule categories and/or contractor labor categories. A staffing plan can be included in the Resource Acquisition Strategy below. **Note:** This section represents the total staff months for the project by phase, and therefore should be equal to the sum of the estimated task staff months (from the Detailed Work Estimate Section below).
4.1.3 Total Budget	Provide the estimated budget required to accomplish the project, which should be equal to the sum of the estimated budget by phase (based on the data in the Detailed Work Estimate Section). **Comment:** If the project phase is long term (greater than 1 year) and crosses fiscal years, subdivide by fiscal years and provide complete project totals.

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4.0 Task Descriptions, Schedule, and References, Continued

4.1 Project Summary (continued)

Topic	Instructions
4.1.4 Project/Task Interdepen-dencies	Specify project/task interdependencies for each phase. A diagram may be presented to illustrate the interdependencies. **Examples** of task dependencies: • IRB authorization to proceed • Timely acquisition of human and equipment resources • Workable interfaces to needed systems and databases

4.2 Required Facilities

Identify the required computer hardware and software facilities needed to complete the task.

Indicate whether contractor support is required.

Note: If the computer hardware and software facilities and services required are not currently available, then the Resource Acquisition Strategy (defined in Section 4.5) must be completed.

4.3 Task Management

Supplement the information provided in Section 2.0, *Project Organization and Responsibilities*, if the organization structures and responsibilities vary by phase, activity, or task.

Example: Identify the organizations responsible for specific tasks within phases if different from the System Development Team.

4.4 Technology Applications

Describe the technologies and tools used to support the project. Identify any unique needs for specific tasks within phases.

If problems could arise as a result of the use of new technologies for computer hardware, software, software development methodologies, automated tools, etc., then an assessment of associated risks should be provided in Section 5.0, *Risk Areas and Mitigation Strategies.*

Continued on next page

4.0 Task Descriptions, Schedule, and References, Continued

4.5 Resource Acquisition Strategy

Briefly describe the acquisition strategy for any specific hardware, software, or contracting support required for completion of the project.

Present the schedule, responsibilities and activities to accomplish the acquisition strategy.

Comment: This section is further refined in the Acquisition Plan if one is developed during the Procurement Process. Contact OIT PMS or the Office of Finance, Procurement Division, for further information on acquisitions.

4.6 Staffing Impact Strategy

If the project creates major changes to the existing work force, a plan is developed with the Office of Human Resources to address work force planning.

4.7 Phase Related Requirements

Describe the detailed work estimates, the tailored life cycle activities, and tailored list of deliverables by phase of the SDLC.

Note: The actual structure of this subsection may be organized as best suits the structure of the project/phase.

Topic	Instructions
4.7.1 Detailed Work Estimates	Summarize the task management considerations during each phase of the life cycle. Use diagrams or tables where feasible. The following items may be included as appropriate: • Schedule and budget • Staff months of effort • Support tools required by phase • Contractor support required • Detailed activity chart (or work packages) showing subtasks within task and interrelationships with other tasks within each phase of the life cycle

Continued on next page

4.0 Task Descriptions, Schedule and References, Continued

4.7 Phase Related Requirements (continued)

Topic	Instructions
4.7.2 Development Activity Tailoring	Provide a complete checklist or table listing each activity or discipline within each phase of the project. **Note:** An activity or discipline in this context can refer to overall CM, Project QA, Testing, and Training activities; as well as specific tasks required to develop and implement plans, deliverables, and code. • Provide the activity/discipline/task name and a detailed description of the item. The task description should be as detailed as necessary to define the task clearly and distinguish among similar tasks. • Mark the items to indicate a comprehensive or reduced level of effort based on project needs. If necessary, also provide a comment or rationale for this decision.

Continued on next page

4.0 Task Descriptions, Schedule and References, Continued

4.7 Phase Related Requirements (continued)

Topic	Instructions
4.7.3 List of Required Deliverables	Identify the work products (e.g., documentation, code) anticipated to be developed during each phase of the project. Explain how each item is tailored to the type of development activity anticipated during the project. Identify any changes made to the SDLC life cycle standards by combining information, moving information to other deliverables, or providing additional project-specific deliverables. **Note:** Identify the date/version of the SDLC standard that is used to develop the deliverable list and tailoring items. This is necessary to demonstrate compliance if the project is audited in the future. **Suggestion:** Develop and maintain a Deliverables Table for this purpose with the following columns: • Deliverable Name (from SDLC; include a cross-reference to the Project Document Name if different) • Tailoring Changes Made/Approved • Status of Deliverable (show its Date and Version Number if completed; may also include Location/ID information) When maintained during each phase, this table can easily be used as a reference list throughout the life cycle to: • Identify and locate documents for IMP/TRB verifications and for SDLC Compliance or GAO reviews, and • Help internal Project Management ensure that required deliverables are being completed in a timely fashion.

Continued on next page

4.0 Task Descriptions, Schedule and References, Continued

4.7 Phase Related Requirements (continued)

Topic	Instructions
4.7.4 Quality Assurance Activities	Identify and describe quality assurance activities, review, and milestones for each task/deliverable by SDLC phase. Provide information regarding contractor and Customs organizational responsibilities for each of the activities, reviews, and milestones. **Note:** Overall QA strategy is discussed in Section 2.5; supplementary data for specific tasks can be included here. **Suggestion:** If a table is used to provide information in either Section 4.7.2 or 4.7.3, a column can be added to that table identifying specific QA activities for each task and deliverable. Alternatively, a new table can be created here.
4.7.5 Privacy Issues	Identify privacy issues to be addressed throughout the life cycle and define the process to be established to address these issues. **Comment:** A privacy plan may be more suitable to recognize the importance of privacy issues. The plan must define the privacy requirements and explain how the information system will adhere to privacy laws and regulations, and how it will demonstrate compliance. For more details on a privacy plan, refer to the Privacy Act *Federal Register* Notice discussed in the Section 4, *Planning Phase,* of the Treasury ISLC.
4.7.6 Computer Security Activities	Review and evaluate security risk assessment results and the process owner's evaluation of sensitivity of information and systems to determine if all system vulnerabilities, threats, risks, and privacy issues have been identified. Determine whether an accurate sensitivity level has been made for the sensitivity of the system and information. **Comment:** Details from this section can be used in the project's Security Plan.

5.0 Risk Areas And Mitigation Strategies

Risk Definition

A project risk is something that has a potential negative impact on the cost, schedule, or quality of the final product. Risks need to be assessed as early as possible in order to prevent major stumbling blocks later on in the life of the project.

Risks need to be identified, documented and quantified. Most problems that projects encounter are identified as risks by someone, but never formally identified and documented.

Instructions for the Project Planner

Step	Action
1	Refer to the Risk Management Processes in Chapter 5, and Security Risk Assessment in Chapter 15 for additional knowledge.
2	Identify and describe any risk areas for the project.
3	Analyze each risk and identify factors that contribute to these risks.
4	Estimate the probable cost/impact of the risk should it become a problem, including criticality estimates.
5	Assign a priority to each risk item before they pose threats to the project or become the source of re-work.
6	Address approaches for preventing or mitigating the impacts of the risk factors. Add subsections as necessary to separate different categories of risk or different risk-inducing factors.

Sources of Project Risks

Here are examples of common software development project risks.

- Personnel shortfalls
- Unrealistic schedules and budgets
- Shortfalls in externally supplied components and services
- The use of new computer hardware or software technology
- Inappropriate/inadequate/incomplete/unstable requirements
- Performance requirements that are too ambitious

Continued on next page

5.0 Risk Areas and Mitigation Strategies, Continued

Management Reference

See Chapter 5, *Risk Management Processes*, for further information on managing and tracking identified risks during the course of the project's life.

Section C
Data Management Plan

Introduction

In the plan, the project is asked to address the data requirements and data management activities for the entire life cycle. The Data Management Plan is structured so that information can be added progressively as it is developed during activities defined in each life cycle phase.

Plan Format

Sections 1 and 2 are based on information developed in the Project Definition Phase as part of the responsibility of the Business Sponsor and/or his designated representative.

This entire plan is an incremental effort jointly created as the responsibility of the System Development Team (likely the Data Administration Liaison) and the Data Administration Branch. Some sections (e.g., models) which are outputs of information engineering tools and repositories can be attached as appendices.

Responsibility

The Project Manager is responsible for ensuring that the Data Management Plan is updated and complete. Users, AIS Security, Operations, Training, and other System Development Team staff may assist in its construction as indicated.

The Data Administration Branch is responsible for verifying and implementing the results of the plan.

Assistance

Assistance for developing any portion of this plan can be obtained from the Data Administration Branch.

In This Section

DATA MANAGEMENT PLAN

Project Name:		Project Number:	
Date Prepared:	Date Updated:	Date Presented:	Date Approved:

1.0 Information Needs

This information is collected in Section 5.0 of the Users Requirements document. That section should be completed by the Business Sponsor with the assistance of the Data Administration Branch. Include a summary paragraph here and reference that document's location.

2.0 Data Needs *(To be completed in conjunction with the Business Sponsor and with the assistance of the Data Administration Branch)*

2.1 Data Administration Responsibilities

2.1.1 Liaisons to the Data Administration Branch
2.1.2 Primary Data Users for each data entity identified

2.2 High Level Data Requirements

2.2.1 Entity List
2.2.2 Entity Definitions
2.2.3 Entity Identifiers
2.2.4 Conceptual Data Model
2.2.5 Sources of Data
2.2.6 Information Flow Plan
2.2.7 Validation Procedures
2.2.8 Information Distribution Plan
2.2.9 Information Collection Burden

2.3 Life Cycle Methodology and Tools

Continued on next page

DATA MANAGEMENT PLAN, Continued

3.0 Definition Phase

3.1 Data Requirements

- 3.1.1 Interview Plans
- 3.1.2 Information Analysis Plan by Process
- 3.1.3 Entity Normalization
- 3.1.4 Conceptual Data Model Revision Plan
- 3.1.5 Data Element Validation Plan
- 3.1.6 Data Retention Requirements
- 3.1.7 Data Availability Requirements

3.2 Data Quality Assurance Plan

3.3 Data Security Requirements and Strategy

- 3.3.1 Data Security Requirements and Their Implementation
- 3.3.2 Sensitive Data
- 3.3.3 Compliance with the Department of the Treasury Security Manual TD P 71-10

4.0 Design Phase

4.1 Logical Data Models

4.2 Physical Database Design

4.3 Data Conversion Strategy and Plans

- 4.3.1 Data Conversion Plan
- 4.3.2 Access to Existing Data
- 4.3.3 Data Load Plan

Continued on next page

DATA MANAGEMENT PLAN, Continued

5.0 Construction Phase

5.1 Data Backup Requirements

5.2 Logging and Recovery Requirements

5.3 Disaster Recovery Requirements

5.4 Documentation and User Training Materials

6.0 Acceptance Phase

6.1 Data Testing Strategy and Test Plan

6.2 Testing Support Requirements

7.0 Transition Phase

7.1 Cut Over Plan

7.1.1 Data Administration Branch Activities
7.1.2 Configuration Management Activities

8.0 Operation, Maintenance, and Disposition

8.1 Support for Configuration Management

8.2 Support for Audits and Evaluations

8.3 Response to Evaluation Reports

Data Management Plan Guidelines

Introduction

These guidelines provide assistance and direction for preparing the Data Management Plan and updating it throughout the life cycle.

Definition: Corporate Data Dictionary

The Corporate Data Dictionary is the approved, standard repository for all metadata available to users of Customs automated systems. It is designed to support all environments for a given system, including development, testing, training, and production.

The Data Administration Branch will ensure that the Corporate Data Dictionary accurately reflects all environments in which the system exists, in accordance with the information provided during the construction of this plan.

In This Section

1.0 Information Needs

Introduction

The determination of information needs is the first, and perhaps the most important step in development of an automated system.

Responsibility

The Business Sponsor is responsible for the first draft of the information needs and for the information required for project initiation.

Participants

The following personnel should participate:

- Data Administration Branch
- System Development Team
- Data Administration Liaison

Definition: The Data Administration Liaison is a role performed by a member of the System Development Team specifically appointed to act as the single point-of-contact between the Data Administration Branch and the project.

Examples

The high-level information needs identified as the user requirements can include:

- Descriptions of inputs (e.g., forms, electronic media) used to gather information
- Conceptual user-view of information and data flows
- Expected outputs and interfaces

Location

This information should be entered into Section 5.0 of the User Requirements document. This section will summarize and provide a reference to that material.

Reference: Chapter 14, Section B, *User Requirements*

2.0 Data Needs

2.1 Data Administration Responsibilities

This section includes:

- A definition of the roles and responsibilities of team positions associated with developing the information and data requirements.
  - Identify the System Development Team members tasked with serving as primary and secondary liaisons to the Data Administration Branch. These positions are responsible for ensuring that clear, concise, and accurate information is supplied to the Data Administration Branch. On large projects, this may be a full time position; while on smaller projects, the liaison would probably not be dedicated full time to this function.
  - Assign responsibilities for documenting data requirements within the System Development Team for subsequent delivery to the Data Administration Branch via the Data Administration Liaison.
  - Identify the roles and responsibilities of other individuals associated with data administration activities if appropriate.

    Example: A data analyst may be identified as the person documenting the meaning of the data and the business rules/procedures to group and refine the data.
- Identification and inclusion of the primary data users for each data entity identified during the definition of information needs and data needs.

Note: Ensure that the Customs *Data Object Definition and Naming Standard* is followed. Contact the Data Administration Branch for a copy of this document.

Continued on next page

2.0 Data Needs, Continued

2.2 High Level Data Requirements

Following are instructions for providing the information required in each section of the document and who is responsible for performing the activity involved.

Topic	Instructions
2.2.1 Entity List	List all entities about which data is needed. **Responsibility:** Business Sponsor, Data Administration Liaison, System Development Team
2.2.2 Entity Definitions	Provide precise business definitions of each entity. **Responsibility:** System Development Team, Business Sponsors, Data Administration Liaison
2.2.3 Entity Identifiers	Identify the attributes of each entity which uniquely identify an occurrence of the entity. **Responsibility:** Data Administration Liaison, Data Administration Branch
2.2.4 Conceptual Data Model	Develop a graphic representation of the entities and their interactions. This will be used: • To coordinate the data requirements of one project with the overall requirements of Customs • To prevent duplication of already existing Customs data structures **Responsibility:** Data Administration Liaison with assistance from Data Administration Branch

Continued on next page

2.0 Data Needs, Continued

2.2 High Level Data Requirements (continued)

Topic	Instructions
2.2.5 Sources of Data	Identify likely organizations and the functions they perform to supply data to the application. If possible, provide the name of a point-of-contact for these sources. **Responsibility:** Business Sponsor, Data Administration Liaison, User
2.2.6 Information Flow Plan	Provide a plan for the physical flow of information through the new system. This is important when: • Data is added to the system from external sources • When multiple physical databases and/or files will be updated from a single source **Responsibility:** Project Manager, Data Administration Liaison, Interfacing System(s) personnel
2.2.7 Validation Procedures	Document and perform the procedures to validate that each entity in the high level information flow is in the conceptual model and vice versa. **Responsibility:** Data Administration Liaison
2.2.8 Information Distribution Plan	Document the usage of each entity in matrices by function and/or distribution/location. Consider other systems which may need access to the information to minimize problems that may be presented by distributing the data. **Responsibility:** Project Manager, Data Administration Liaison, Data Administration Branch

Continued on next page

2.0 Data needs, Continued

2.2 High Level Data Requirements (continued)

Topic	Instructions
2.2.9 Information Collection Burden	Document any additional data collection burden imposed by the new system. This may include: • Additional time spent by the user to enter the data • Additional data storage requirements • Any applicable Freedom of Information Act (FOIA) and Privacy Act considerations. **Responsibility:** Project Manager, Data Administration Liaison, Business Sponsor, User, AIS Security

2.3 Life Cycle Methodology and Tools

If the System Development Team plans to use an automated modeling tool other than Cool:GEN (formerly known as Composer) while developing requirements, describe the tool and how information from it will be transported to the Data Administration Branch for implementation.

- If it is necessary for the Data Administration Branch to use that transport vehicle to receive the data, ensure that the Data Administration Branch has been supplied with the transport mechanism which will feed directly into Cool:GEN.

- Describe here any anomalies for the team which require additional procedures or steps outside the standard Customs Data Administration life cycle procedures.

Reference: Contact the Data Administration Branch for additional information if required.

3.0 Definition Phase

Introduction

The definition phase activities and deliverables are important since they refine the conceptual requirements into the detailed data requirements of the automated system.

Information must be provided on the following topics:
- Data Requirements
- Data Quality Assurance
- Data Security

Reference: See Chapter 14, Section C, *Functional Requirements*, Section 5.0, Data Characteristics.

3.1 Data Requirements

Following are instructions for providing the information required in each section of the document to describe the data requirements and who is responsible for performing the activity involved:

Topic	Instructions
3.1.1 Interview Plans	Determine and document: • Functional subject areas of interviews • Interviewees name and position • The relationship between the data requirements interviews and the functional requirements interviews **Responsibility:** Data Administration Liaison, Users, Business Sponsor

Continued on next page

3.0 Definition Phase, Continued

3.1 Data Requirements (continued)

Topic	Instructions
3.1.2 Information Analysis Plan by Process	Determine and document the plan to identify and analyze the information requirements required by each process identified during functional analysis. This analysis and the Conceptual Data Model will produce the detailed data requirements for the system and provide the basis for the logical data model design. **Responsibility:** Data Administration Liaison, Users, System Development Team
3.1.3 Entity Normalization	Determine and document the methodology used to normalize the entities required by each process. Three conditions apply: • Standard Customs data normalization methodologies follow the Information Engineering Methodology • Standard Customs data normalization requires the Conceptual Data Model to be compatible with these Third Normal Form definitions. • All data items must, at a minimum, be compliant with the current ANSI SQL standards **Responsibility:** Data Administration Liaison and Data Administration Branch

Continued on next page

3.0 Definition Phase, Continued

3.1 Data Requirements (continued)

Topic	Instructions
3.1.4 Conceptual Data Model Revision Plan	These revisions are an iterative process to ensure that the conceptual data model is complete. It includes two tasks: • Determine and document the plan for updating the conceptual data model as new entities are determined. • Review the Information Flow Diagrams to ensure that data entities representing all the data in the data flows are included in the conceptual data model. **Responsibility:** Project Manager, Data Administration Liaison
3.1.5 Data Element Validation Plan	Document the plan to validate that all data elements in the Data Flow Diagrams are included in the Logical Data Model. **Responsibility:** User, Data Administration Liaison, Data Administration Branch, Project Manager

Continued on next page

3.0 Definition Phase, Continued

3.1 Data Requirements (continued)

3.1.6 Data Retention Requirements	Determine and document the retention requirements and time periods for each stage in the archival/migration process of the data. Stages could include: • Initial population of the database • Active online access • Archival to on-line storage • Migration to any data warehouses • Archival to off-line storage • Destruction/final disposition **Reference:** Contact the Records Management Branch within the Office of Finance for assistance if required. **Responsibility:** Project Manager, Data Administration Liaison, Systems Operations Division
3.1.7 Data Availability Requirements	Document the user's requirements and acceptable delays (time) in retrieving the needed data. **Example:** Is this a 24 hour by 7-day-per-week application or can it be down at certain times? How long a delay would be acceptable for routine data access? **Responsibility:** Project Manager, Data Administration Liaison, Business Sponsor, User, AIS Security

3.2 Data Quality Assurance Plan

This section provides details of the plan on how data quality will be monitored and verified, in addition to any edits generated by referential integrity definitions included within the relational database.

Note: Relational database management system components to supply referential integrity, such as constraints, will be established by the Data Administration Branch for baseline quality assurance.

Continued on next page

3.0 Definition Phase, Continued

3.2 Data Quality Assurance Plan (continued)

Benefits of centralized referential integrity definitions:

- Constraints remove most of the requirements for quality control from the application program and place these requirements within the database management system.
- These definitions are easily identifiable and will apply across all applications using the data element.
- Enforcement is centralized, providing a single location for Customs business rules concerning data.

Tasks: There are two tasks associated with documenting this information:

- If quantitative measures of quality for specific data elements or combinations of data elements are established, provide a plan for measuring the database ability to meet these measures.
- Identify the organization and who within that organization is responsible for monitoring data quality, what data will be monitored, how it will be monitored and how often, how problems will be resolved and who will monitor problem resolution.

Responsibility: Project Manager, Project QA, Data Administration Liaison, Data Administration Branch, Business Sponsor

Continued on next page

3.0 Definition Phase, Continued

3.3 Data Security Requirements and Strategy

This section documents the results of three tasks:

Topic	Instructions
3.3.1 Data Security Requirements and Their Implementation	Identify data security requirements, record the requirements and develop and document a plan to implement them. This involves the data management aspects covering: • Physical Protection/Storage of the Data • Database Protections • Database Access Permissions • Information Dissemination Controls
3.3.2 Sensitive Data	Detail responsibility for identifying sensitive data and protecting the data in accordance with the standards and requirements defined by the AIS Security Branch. • Identify data considered sensitive under FOIA, the Computer Security Act, and the Privacy Act. • Identify appropriate data security measures to protect this data.
3.3.3 Compliance with Treasury Security Manual TD P 71-10	Ensure data security requirements are addressed in accordance with applicable strategies in the: • Department of the Treasury's *Security Manual* TD P 71-10 Provide greater detail by using the system security and integrity requirements worksheets that are provided in the risk assessment plan described in: • Department of the Treasury's *Risk Assessment Guideline* TD P 85-03

Responsibility: Business Sponsor, User, Project Manager, Project QA, Data Administration Liaison, AIS Security, Data Administration Branch

Reference: Section 5.6 in Chapter 14, Section C, *Functional Requirements*.

4.0 Design Phase

4.1 Logical Data Models

Logical Data Models are created and maintained by the Data Administration Branch, based on the Conceptual Data Model and requirements identified and supplied by the System Development Team. These logical data models are included/referenced within or attached to this plan and revised as appropriate.

Tasks: There are two tasks associated with this information:

- The System Development Team should validate all data entities, attributes, identifiers and relationships have been identified by examining the Data Flow Diagrams to ensure that all data elements in the flows have been accounted for in the Logical Data Model.

- After System Development Team validation, users should review the Logical Data Model and approve its accuracy.

Responsibility: Data Administration Branch, Users, Data Administration Liaison, System Development Team

Note: As modifications to the data requirements are identified, and after approval of the modification by the Data Administration Branch, the Data Administration Branch will apply the changes to the Logical Data Model.

Modifications are identified to the Data Administration Branch through standard Customs procedures for requesting changes to databases.

Reference: See the procedures described in the Data Center User Guide. Contact the Systems Operations Division for a copy.

Continued on next page

4.0 Design Phase, Continued

4.2 Physical Database Design

The location of the physical database model must be included in this document. Copies of this physical structure may be attached as well once they are finalized.

Responsibility: Data Administration Branch, Project Manager, Data Administration Liaison

Note: In consultation with the Data Administration Branch, the Project Manager must include appropriate resources and time within the project's schedule for the activities performed to create both the logical and physical database models, and the physical database environment.

Relevant Activities: These activities include the following:

- **Design database structure:** Physical database structures are designed by the Data Administration Branch after agreement with the System Development Team on the Logical Data Model structure. The logical data model is transformed into a physical database structure. This physical database structure is the Data Structure Diagram (DSD).

- **Perform design walkthrough:** A technical walkthrough of this physical model should be held between the System Development Team and the Data Administration Branch to ensure understanding of the design. Users and other interested parties may also attend this walkthrough.

  Reference: See procedure in Chapter 3, Section C, *Technical Reviews*

- **Implement database:** From the DSD, Data Definition Language (DDL) statements are created for the target database management system and implemented by the Data Administration Branch.

- **Populate Corporate Data Dictionary:** As all or portions of the Logical Data Model are approved and transformed into physical database designs, metadata requirements will be migrated to the Corporate Data Dictionary (CDD) by the Data Administration Branch. When modifications are implemented in the Data Structure Diagram, these modifications are also applied to the CDD by the Data Administration Branch.

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4.0 Design Phase, Continued

4.3 Data Conversion Strategy and Plans

Determine and document (Section 4.3.1) the project's Data Conversion Plan if existing data will be used in the new system, but needs reformatting before the new system can make use of it. Include information such as sources, media, load programs required (automated procedures), and validation plans.

If existing data is required but no reformatting is necessary, the Data Administration Branch will ensure access to it for the new system. Document any assumptions or special considerations in Section 4.3.2.

If the required data does not currently exist, define a Data Load Plan (Section 4.3.3) for populating necessary reference/edit tables and initial data.

Responsibility: Program Manager, Data Administration Liaison, Project QA, Data Administration Branch

5.0 Construction Phase

5.1 Data Backup Requirements

All databases used by Customs are backed up nightly if changes have been made that day. If there are other requirements, please specify them here.

Responsibility: Systems Operations Division, System Development Team, Business Sponsor

5.2 Logging and Recovery Requirements

The database management systems used by Customs for automated information systems design and modification, development, testing, and operations all support full logging and recovery of those systems.

Typically, only production systems record the logging activity permanently for recovery processes.

If there are additional requirements in these areas, determine and document these additional requirements.

Responsibility: Project Manager, Data Administration Liaison, Business Sponsor, AIS Security

5.3 Disaster Recovery Requirements

The following questions should be answered for each database table:

- Is the data absolutely required to operate the system?
- Is it possible to supply an empty table for writes for the duration of the disaster?
- How long can the table be unavailable before significant impact to the field occurs?
- What are the ramifications if the table is unavailable due to a disaster?

Responsibility: Project Manager, Data Administration Liaison, Business Sponsor, AIS Security

Continued on next page

5.0 Construction Phase, Continued

5.4 Documentation and User Training Materials

Ensure that data management concerns are included in all documentation, not just the models/dictionaries. User training materials should include an emphasis on data creation, collection, validation, and quality assurance issues.

If there is anything special that a user needs to understand concerning the data, include these comments here.

Examples:

- Information in this system may not be released to other organizations.
- When you enter the year in this field, you must enter all four digits.
- Provide reference tables that identify valid values for specific fields based on the business requirements.

Responsibility: Data Administration Liaison, System Development Team

6.0 Acceptance Phase

6.1 Data Testing Strategy and Test Plan

Document general data testing and test plan strategies for testing database performance and functionality to prove that a viable database design exists which meets detailed data and functional requirements.

In addition to field edit tests, database performance must be verified during testing. If this information is included in the System Test Plan started during the Definition Phase, it can be referenced here.

Specific tests developed for database regression testing may also be included here as well as in the System Test Plan.

Responsibility: Project Manager, System Development Team, Data Administration Liaison, Project QA

6.2 Testing Support Requirements

Include plans for supporting integration and acceptance testing of the databases that have been developed (may refer to the System Test Plan).

Responsibility: Project Manager, Data Administration Liaison, Data Administration Branch

7.0 Transition Phase

7.1 Cut Over Plan

Determine and document the activities the Data Administration Branch and Configuration Management must carry out to support the migration of the system from one environment to another.

Activities: Typically, this transition involves

- Unloading/loading test data
- Securing the target environment's version of software and data definitions
- Updating the target environment's CDD and database structures
- Loading any data that has been created or converted from an existing format

Time Requirements: If data conversions are a required part of the cutover, the Database Management Team requires a minimum of two weeks to test the conversion program and determine the timings which would be required for the production cutover.

Responsibility: Project Manager, Data Administration Branch, Configuration Management, Systems Operations Division.

8.0 Operation, Maintenance, and Disposition

8.1 Support for Configuration Management

Ensure that the Data Management Plan and Configuration Management (CM) Plan are synchronized and do not contradict each other. Indicate here any special data management activities required to support the CM requirements.

Responsibility: Project Manager, Data Administration Liaison, Configuration Management

8.2 Support for Audits and Evaluations

Determine and record any data management activities which are required to support the audit and evaluation processes.

Responsibility: Project Manager, Data Administration Liaison, Data Administration Branch

8.3 Response to Evaluation Reports

Determine and record planned actions if data management-related actions are required to address findings or recommendations of an audit or evaluation report.

Responsibility: Project Manager, Data Administration Branch, Data Administration Liaison, System Development Team

Section D
Configuration Management Plan

Introduction

The Configuration Management (CM) Plan defines the set of CM procedures, staff CM responsibilities, and configuration items for the project.

Definitions

CM: The process of managing changes made to selected hardware, software, and telecommunications components (including their descriptions) throughout the development and operational life cycle of the system.

Configuration Items (CIs): Selected components/work products (e.g., hardware, software, tests, and documentation) that are placed under configuration management and treated as a single entity.

Baselines: Provide the official standard on which subsequent work is based and to which only authorized changes are made. They act as a measurable progress point, a basis for subsequent development and control, and as a quality check point.

Responsibility

The Project CM Team is responsible for the creation and maintenance of the CM Plan. Other System Development Team members may assist in its construction.

The Project Manager, in consultation with Customs Configuration Management Team and QAT, is responsible for its approval and incorporation into the overall Project Plan.

In This Section

CONFIGURATION MANAGEMENT PLAN

Project Name:		Project Number:	
Date Prepared:	Date Updated:	Date Presented:	Date Approved:

1.0 Introduction

2.0 Configuration Identification

3.0 Configuration Control

4.0 Configuration Status Accounting

5.0 Configuration Audits

5.1 Functional Configuration Audit

5.2 Physical Configuration Audit

6.0 Problem Reporting and Corrective Action

7.0 Tool, Techniques, and Methodologies

Configuration Management Plan Guidelines

Introduction

These guidelines discuss the basic information that is required for defining CM procedures for a project. This information is adapted from the *Treasury Information System Life Cycle Manual* (TD P 84-01) v2.0, July 1994.

1.0 Introduction

The following information should be included in this section:

- Identify the specific purpose and scope of the CM plan.
- Name and briefly describe the project covered by the CM Plan.
- Include the name of configuration manager for the system who will be responsible for establishing and maintaining the configuration management records for the system.
- Identify the membership of the Project Change Control Board (CCB) and include plans to establish the CCB.

  Note: The CCB examines requested changes to the system, directs the change request impact analysis and, based on the results, determines the changes that are to be made and those that are not to be made to the system. See Chapter 3, Section E, *Requirements Change Control/Impact Analysis*, for further details.

- Identify staff roles and responsibilities for the various CM functions relating to project control of hardware, software, documentation, data, and requirements. The CM activities and procedures to be followed by the specified staff are described in the following sections.

2.0 Configuration Identification

Configuration identification allows for the isolation of items to be controlled, the tracking of their status, and reporting of their configuration. Configuration identification involves selecting the CIs that make up a system and then defining them. This delineation of specific CIs will enable all individuals involved in the evolution of the system to communicate effectively, using a common language. It provides a basis for applying configuration control to the system being developed and integrated. The result of the configuration identification is a complete and accurate representation of the system that is known and available

Continued on next page

Configuration Management Plan Guidelines, Continued

2.0 Configuration Identification (continued)

at all times. Baselines are established at formal points in the life cycle at which the system configuration is defined and approved. This also provides a formal point for controlling future changes.

In this section, identify the baselines to be used on the project and define the configuration baseline characteristics. As appropriate, also identify:

- Documentation that establishes the selected system baseline;
- Documentation and media defining code and documentation that are placed under the configuration control, and the corresponding version, release, and change status of each deliverable item; and
- System components comprising the application system, to the module level.

3.0 Configuration Control

Software control involves a set of procedures to ensure that the integrity of the system is preserved when approved changes are being made to the system, or in the event of a disaster and restoration of the system is needed. In this section the following topics are discussed:

- Identify approval/disapproval authority for changes, library controls, and the librarian used for the project.
- Describe the procedures for controlling the preparation and dissemination of changes to deliverable software and documentation that have been placed under configuration control.
- Detail the project's specific change control and software control procedures.

Software control ensures that changes to the computer programs are developed and tested using a valid copy of the programs and the test database, and that such changes do not adversely affect system users. Software control procedures are particularly important during the operation phase of the life cycle to document and track maintenance changes. However software control is also important during the internal project development and implementation phases to control changes during the planning, development, and installation of the system or system enhancements under construction.

Continued on next page

Configuration Management Plan Guidelines, Continued

4.0 Configuration Status Accounting

Configuration accounting is an administrative procedure for maintaining system baselines and monitoring the status of the system throughout the life cycle. The configuration accounting procedure may also include documentation for use by the project throughout its life cycle.

State the procedures for generating documentation that will provide traceability of changes to controlled products for the project and communicate the status of configuration items to management. Identify data content and format of accounting records, and state their frequency and distribution.

Examples of selected Configuration Status Accounting Reports:

- A **Configured Articles List** (CAL) records the physical configuration of the system under development and the software support environment down to the lowest levels controlled by CM. An example of a CAL table follows:

Type of CI	Description	Example
System Release	Header: System Name, System Release, Release Date	AES 1.0 Development
Software CI	Name, Release, Patch/Module (may also include Patch/Module descriptions and requirements fulfilled)	AES 1.1 Development
Hardware CI	Hardware Components	HP 9000
System Software	Name, Version	UNIX 3.2
COTS Software	Name, Version	ORACLE 6.0

- A **Baseline Documents List** (BDL) records the baseline technical documentation of a system to be controlled by CM. Data recorded includes the system name/release/version, the title of the document, its publication date, and any revision number. This information can be maintained in a project-specific table or in the Document database part of the IT Project Tracking System.

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Configuration Management Plan Guidelines, Continued

4.0 Configuration Status Accounting (continued)

- A **Hardware and COTS Product Inventory** documents the system hardware and COTS product configuration per environment (development, test, production). A record is maintained for each hardware configuration item and associated COTS configuration item and reports are distributed to all members of the technical team and production when changes occur.

5.0 Configuration Audits

State the procedures for preparation and execution of audits for establishing the traceability of requirements identified for the project. The procedures identify what will be certified and provided to management for approval.

Configuration audits are examinations of the products and related documents submitted for inclusion in a baseline to assure that they are complete, clearly presented, and internally consistent. This examination is oriented to adherence to guidance and standards. These audits support reviews and evaluations of the system by ensuring that required products and documents are complete and provide effective traceability to related products. Audits do not evaluate qualitatively the programmatic and/or technical content of the product. This is done by other technical reviews and quality assurance activities. Audits help to ensure that the resources used to conduct those reviews and evaluations are not applied to products that are not ready for the review.

5.1 Functional Configuration Audit

Describe the point at which Functional Configuration Audits (FCA) will be completed and the process to be followed. An FCA is a means of validating that the developer has completed the system in accordance with the requirements definition. The FCA ensures that technical documentation and test analysis/reports accurately reflect the functional, operational, and performance characteristics specified.

5.2 Physical Configuration Audit

Describe the point at which a Physical Configuration Audit (PCA) will be completed and the process that will be followed. The PCA is a means for validating the system baseline. The PCA ensures that configuration items are developed as specified in the design documents; that the items are tested, verified, and/or validated successfully; and that any differences highlighted for resolution.

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Configuration Management Plan Guidelines, Continued

6.0 Problem Reporting and Corrective Action	Describe the procedures for reporting, prioritizing, tracking, and resolving problems that result from reviews, audits, and tests. This includes the procedures to be used to propose changes to baselines (e.g., Problem/Change Reports) and those for documenting and distributing changes to software or documentation (e.g., Change Notices) as appropriate.
7.0 Tool, Techniques, and Methodologies	Identify the automated tools, techniques, and methodologies to be used to support configuration management. This includes procedures for ensuring accuracy of the release builds and turnover/delivery package development.

Section E
Quality Assurance Plan

Introduction

The project's Quality Assurance (QA) Plan specifies the activities to be performed internally within the project to:

- Ensure the quality of the products being developed (including associated documentation);
- Verify compliance of the project and its results with applicable standards, procedures, and plans/requirements; and
- Provide insight into the processes and development activities being performed.

The results of these QA activities are to be considered internal to Customs; formal General Accounting Office (GAO) or Treasury Inspector General (IG) reviews are not within the scope of this document.

Location

The information identified in these guidelines must be developed by all projects during the planning phase and tracked during development.

Based on the size of a project, this information can be included within the Project Plan or described in a separate document as defined here.

Responsibility

The Project QA Team is responsible for the creation and maintenance of the QA Plan/activities. Other System Development Team members may assist in its construction.

The Project Manager, in consultation with Senior Management, is responsible for its approval and incorporation into the overall Project Plan.

In This Section

QUALITY ASSURANCE PLAN

Project Name:		Project Number:	
Date Prepared:	Date Updated:	Date Presented:	Date Approved:

1.0 Introduction

1.1 Purpose and Scope

1.2 Background

1.3 Document Overview

1.4 Relationship to other Plans

2.0 Reference Documents

3.0 Organization and Resources

3.1 Organizational Responsibilities

3.2 Resources
- 3.2.1 Facilities and Equipment
- 3.2.2 Personnel
- 3.2.3 Other resources

3.3 Quality Reporting and Records

4.0 QA Procedures, Methods, and Tools

4.1 Procedures

4.2 Metrics

Continued on next page

QUALITY ASSURANCE PLAN, Continued

4.0 QA Procedures, Methods, and Tools (continued)

4.3 Tools (including checklists and baselines)

5.0 Evaluation Activities and Schedule

6.0 Tailoring Guidelines

Appendices

Glossary
Project-specific QA procedures and checklists

Quality Assurance Plan Guidelines

Introduction

This plan defines the Quality Assurance program and practices to be followed by the project. The format suggested in these guidelines is of less importance than providing a document which clearly describes the information required.

1.0 Introduction

The Introduction to this document should contain the following information:

- The general purpose and scope of this QA Plan
- A short background of the project and description of the products to be reviewed.

  Note: This information can be included in an Appendix or referenced if in other documents; the purpose here is to provide enough information to understand what is being validated.

- A brief introduction to this Plan and an overview of the contents of the chapters to follow
- The relationship of this document to other project documents and plans. Such documents can include the Project Plan, a Risk Management Plan, the Configuration Management Plan, a System QA Plan, Test Plans, etc.

2.0 Reference Documents

List all documents referenced in this plan as well as documents that this plan is based on or dependent upon.

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Quality Assurance Plan Guidelines, Continued

3.0 Organization and Resources

This section presents the responsibilities, roles, and QA reporting structure.

Topic	Instructions
3.1 Organizational Responsibilities	Describe the organization(s) responsible for the fulfillment of, and for ensuring compliance with, the QA requirements. Include: • The authority and responsibility of each organization • The relationship between these organizations • The structure and personnel of each organization • An organization chart, including interrelationships
3.2 Resources	This subsection will • Identify the facilities and equipment to be used for these activities, and • Describe the number and skills of those personnel that will perform the Project QA activities.
3.3 Quality Reporting and Records	Project Quality reports and records are identified in this subsection. Include the following information. • Define reports to be prepared, including their author, purpose, frequency, and recipients. • Describe plans for preparing and maintaining records for each activity to be performed, including how long these records will be preserved. • Identify formats used or information to be captured for each type of report or record, and plans for how they will be made available for review. **Examples** of Quality Reports and Records include • Minutes of meetings and management reviews • Programmer notes and test reports • Results of audits and technical reviews • Quality metrics and team status reports

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Quality Assurance Plan Guidelines, Continued

4.0 QA Procedures, Methods, and Tools

This section identifies and defines

- The Project QA activities to be performed
- The frequency they are to be performed and verified
- The metrics to be collected for process and product improvement purposes
- The tools to be used to perform these activities.

Multiple sections in the QA Plan can be used to describe these activities in detail. Examples of each type of information follow.

Examples of QA procedures and activities:

- Informal Technical Reviews and Walkthroughs
- Formal Peer Reviews and Inspections
- Work Product Acceptance Reviews and Inspections
- Audits including verification of compliance with established standards and procedures (e.g., audits of testing activities, CM, documentation)

Examples of Frequency of QA method identified by activity:

- Formal Peer Reviews and Inspections will be performed for 100% of the critical modules in the design, code, and test phases; and will be performed for 20% of other non-critical modules. (Modules will be identified after the Critical Design Review.) Project QA will observe or lead 85% of these formal reviews.
- All deliverable documents will be inspected by Project QA before the project moves to the next phase.
- Project QA will observe a random sample set of design, code, and test procedure walkthroughs and at least 25% of the testing activities to verify that the activity occurred and that it was conducted according to the defined guidelines. The sampling coverage may be adjusted based on the number of discrepancies recorded.

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Quality Assurance Guidelines, Continued

4.0 QA Procedures, Methods, and Tools (continued)

- All testing activities and baselines will be subject to QA audits.

Examples of Metrics to be collected for analysis:

- Number of Defects Found (total, open, closed) including when found, severity, when fixed, type of defect, where found (e.g., review/inspections, integration test, acceptance test, customer reports/OPRs within 60 days of delivery)
- Actual time (hours) spent on QA activities (to be compared against planned level of effort)
- Number of Requirements (added, changed, tested, not addressed)

Examples of Tools to be used in QA activities:

- Automated tools to verify results, gather metrics, and create reports (e.g., spreadsheets, word processing and graphic tools, corrective action database, access to traceability tool)
- Checklists to perform QA reviews and verifications
- Baselines -- Define each and indicate at what points it may be changed

5.0 Evaluation Activities and Schedule

This section provides information on when each QA activity is to be performed, dependencies on other events, and key development milestones. Specific schedule information can be presented graphically if possible. The scheduled activities should be compared with the overall project plan to ensure that time is available in the master project schedule for these activities to be performed.

Suggestion: For QA review activities which are not easily pre-scheduled, an SDLC deliverables table, similar to the one suggested in the Project Plan, can be used with the addition of a column indicating the QA activity to be performed for each of the deliverables as it becomes available. Additional non-deliverable QA activities (such as audits) can be included in the master project schedule.

Continued on next page

Quality Assurance Plan Guidelines, Continued

6.0 Tailoring Guidelines	Specify exceptions and waiver policies, if any. Note use of evolved test cases and/or recursive or regression testing procedures which must be especially controlled. Indicate which quality gates (e.g., reviews) non-deliverable items and specialized project software must go through, even if they do not follow all quality activities and verifications.
Appendices	Include any general information that aids in understanding the QA Plan (e.g., a Glossary of all terms and abbreviations used). Provide supplemental information that is published separately for convenience in maintenance or distribution (e.g., QA forms, charts, classified data). Include project-specific QA procedures and checklists that can be pulled for use by the System Development Team.

Section F
System Test Plan

Introduction

This plan specifies how the system will be tested, the criteria for success, and the resource needs for testing.

Information from the User Requirements, Functional Requirements, and System Design documentation is used during the creation and revision of this plan.

Responsibility

The System Acceptance Test Team, with the concurrence of the Business Sponsor, is responsible for the creation and implementation of the Test Plan.

Users, Operations, AIS Security, and other System Development Team staff may assist in its construction. Also see the sample format provided for documenting specific Test Cases in Chapter 16, *Development Documentation*.

In This Section

This section contains an annotated outline for the System Test Plan.

SYSTEM TEST PLAN

Project Name:		Project Number:	
Date Prepared:	Date Updated:	Date Presented:	Date Approved:

1. 0 The Plan

1.1 Software Description: Provide a chart and briefly describe the security features, inputs, outputs, and functions of the software being tested as a frame of reference for the test descriptions.

1.2 Milestones: List the locations, milestone events, and dates for the testing.

1.3 Testing Location: Identify the participating organizations and the location where the software will be tested.

1.4 Schedule: Show the detailed schedule of dates and events for the testing at this location. Such events may include familiarization, training, and data, as well as the volume and frequency of the input.

2.0 Resource Requirements

2.1 Equipment: Show the expected period of use, types, and quantities of the equipment needed.

2.2 Software: List other software that will be needed to support the testing that is not part of the software to be tested.

2.3 Personnel: List the numbers and skill types of personnel that are expected to be available during the test from both the user and development groups. Include any special requirements such as multi-shift operational or other key personnel.

Continued on next page

SYSTEM TEST PLAN, Continued

2.0 Resource Requirements (continued)

2.4 Testing Materials: List the materials needed for the test:

2.4.1 Documentation
2.4.2 Software to be tested and its medium
2.4.3 Test inputs and sample outputs
2.4.4 Test control software and worksheets

2.5 Test Training: Describe or reference the plan for providing training in the use of the software being tested. Specify the types of training, personnel to be trained, and the training staff.

2.6 Testing Location: Describe the plan for the second and subsequent locations where the software will be tested.

Continued on next page

SYSTEM TEST PLAN, Continued

3.0 Specifications and Evaluations

3.1 Specifications:

3.1.1 Software Functions: List detailed software functions, including security and privacy features, to be exercised during the overall test.

3.1.2 Test/Function Relationships: List the test to be performed on the software and relate them to each function.

3.1.3 Test Progression: Describe the manner in which progression is made from one test to another so that the entire test cycle is completed.

3.2 Methods and Constraints:

3.2.1 Methodology: Describe the general method or strategy for the testing.

3.2.2 Conditions: Specify the type of input to be used, such as live or test data as well as the volume and frequency of the input.

3.2.3 Extent: Indicate the extent of the testing, such as total or partial. Include any rationale for partial testing.

3.2.4 Data Recording: Discuss the method to be used for recording the test results and other information about the testing.

3.2.5 Constraints: Indicate anticipated limitations on the test due to test conditions, such as interfaces, equipment, personnel, data bases.

3.2.6 Criteria: Describe the rules to be used to evaluate test results, such as the range of data values used, combinations of input types used, and maximum number of allowable interrupts.

3.2.7 Data Reduction: Describe the techniques to be used for manipulating the test data into a form suitable for evaluation, such as manual or automated methods to allow comparison of the *results that should be produced as compared to those that are produced.*

Continued on next page

SYSTEM TEST PLAN, Continued

4.0 Test Descriptions

4.1 Test Descriptions: Describe the tests to be performed.

4.2 Test Controls: Describe the test controls such as manual, semi-automatic, or automatic insertion of inputs, sequencing of operations, and recording of results,

4.3 Inputs: Describe the input data and input commands to be used during the test.

4.4 Outputs: Describe the output data expected as a result of the test and any intermediate messages that may be produced.

4.5 Procedures: Specify the step-by-step procedures to accomplish the test. Include test setup, initialization, steps, and termination.

4.6 Subsequent Testing: Describing the second and subsequent tests.

Section G
Training Plan

Introduction

The training plan outlines the training that will be required by the users in order to make best use of the system under development.

Responsibility

The Training Branch is responsible for the creation of this plan.

The System Development Team, Users, Operations, and AIS Security may provide information during its construction.

The Business Sponsor is responsible for approval of this plan.

In This Section

This section contains an annotated outline for this Training Plan.

TRAINING PLAN, Continued

Project Name:		Project Number:	
Date Prepared:	Date Updated:	Date Presented:	Date Approved:

1. 0 Introduction

1.1 Background: Provide an overview of the project involved in this first paragraph, including the authorities (laws, regulations, directives, etc.) which drive it and the training requirements and needs.

1.2 Executive Summary: In this section, include a brief summary of the following information from the plan:

1.2.1 Overview of the plan, including the training purpose and goals

1.2.2 Overview of Training Tasks, including required deliverables/SDLC phase

1.2.3 Scope of training, training audiences, training audience prerequisites (including assumptions about existing skill/knowledge levels)

1.2.4 Recommended training design techniques

1.2.5 Recommended training delivery media and methodologies

1.2.6 Training-specific, e.g. security and privacy considerations

1.2.7 Recommended curriculum

1.2.8 Training support requirements

1.2.9 Resource requirements

Continued on next page

TRAINING PLAN, Continued

2.0 Detailed Training Plan

2.1 Purpose and Goals: Describe the purpose of the training, including general instructional goals set forth in the plan.

2.2 Scope of Training and Training Audiences: Include information about the following items:

2.2.1 Needs Assessment: Describe 'Who" is to be trained and conduct a Needs Assessment of the audience to be trained.

Note: State the specific job positions to be trained, including support personnel and provide the respective levels of training each position requires. Training levels should be designated as Novice, Intermediate, or Advanced.

2.2.2 Provide an estimate of the total number of personnel to be trained.

2.2.3 Course Requirements: Explain how much content will be covered.

Example: Describe everything there is to know about the subject, just enough to help the audience do their job better, or somewhere in between.

2.2.4 Include information about other government or private organizations to be trained. If only on-site Customs personnel are included in your plan, please specify this.

2.2.5 Include information on support organizations such as the Help Desk, to be trained, and describe any special training considerations for them.

2.3 Security and Awareness Training

2.3.1 Provide security awareness training related to the application, and describe the individual's responsibilities associated with the system in order to protect the individuals and agencies affected.

2.3.2 Include the specific origins of the application system information, e.g. Customs or other government agencies. Explain how such information could affect improper disclosure by students who are not authorized to use the application system.

Continued on next page

TRAINING PLAN, Continued

2.0 Detailed Training Plan (continued)

2.3 Security and Awareness Training (continued)

Note: Specific statutes which pertain to security and privacy restrictions include, but are not limited to, the Privacy Act and the Trade Secrets Act.

2.3.3 Identify any security or privacy restrictions that will impact the training material or information used in the instruction or courses.

2.4 Audience Prerequisites

2.4.1 Specify all prerequisite training which must be provided to the audiences(s) outside the scope of this training plan.

2.4.2 Specify what knowledge and experience levels the audience is assumed to have prior to training.

2.5 Detailed Training Work Breakdown Structure

2.5.1 Explain the ISD (Instructional Systems Design) model to be used.

3.0 Training Design

3.1. Build a cross-reference table which lists courses in the curriculum on one axis (vertical or horizontal) and those users and support groups who will be taking the courses on the other.

3.2 In the table, indicate the recommended courses for each user and support group.

3.3 List and summarize each course in the curriculum, including the skills and functions to be taught.

Continued on next page

TRAINING PLAN, Continued

3.0 Training Design (continued)

3.4 Prepare a detailed daily training plan outline in support of training delivery.

Example:

Users and Support Groups	ACE For Beginners	Intermediate ACE	Advanced ACE
Supervisors	X	X	X
Inspectors	X	X	
Entry Clerks	X		

4.0 Training Media Options

4.1 Build a cross-reference table which lists courses in the curriculum on one axis (vertical or horizontal) and the recommended media options for each course on the other. Indicate on the table, the recommended media choices for each course.

4.2 List and summarize the rationales for each course's "media mix".

4.3 Describe the methodology and plans for preparing each selected media option.

Media Option	ACE For Beginners	Intermediate ACE	Advanced ACE
Quick Ref. Card	X	X	X
On Line Help	X	X	X
CBT Course	X	X	
Instructor-led Class		X	X
Satellite Broadcast	X		

Continued on next page

TRAINING PLAN, Continued

5.0 Curriculum Support Requirements

5.1 List and describe recommended facilities, equipment and supplies.

5.2 List and explain details regarding student registration, transportation, lodging, etc.

5.3 List and explain projected costs associated with each course in the curriculum, or each method of training and all of its associated courses.

5.4 Prepare a detailed daily training plan outline in support of training delivery.

6.0 Cost-Benefit

Scope: The cost-benefit analysis performed as part of this plan is designed to indicate the cost-effective benefits, return on investment (ROI), and rationales concerning why particular training options and media were selected in preference to other possible alternatives.

> **Example:** Provide cost-effectiveness and comparisons on why the instructional media for 'this' audience for 'this' course is to be done by, e.g., CD-ROM as opposed to, for example, classroom training or distance learning.

Note: Refer to Customs *Cost/Benefit Analysis Workbook*, June 1998, for information on format and development of this type of document.

Definition: The cost-benefit analysis is a vital management tool for linking function and budget. The cost-benefit analysis must be updated as appropriate throughout the information system life cycle and the level of detail should be commensurate to the size of the training investment.

Measurements: When the information system provides services to the public, bureau managers should quantify the performance of the information system through systematic measurement outputs.

Continued on next page

TRAINING PLAN, Continued

6.0 Cost-Benefit (continued)

In conducting a cost-benefit analysis to support ongoing management oversight, agencies should maximize return on the investment over the information systems life cycle by establishing and evaluating systematic performance measures. These performance measures should include:

- The effectiveness of program's delivery
- The efficiency of program administration
- A reduction in burden, including information collection, imposed on the public.

Keep the CBA Current: The revised cost-benefit analysis at each phase of the information life cycle provides up-to-date information to ensure the continued viability of an information system prior to and during implementation. Reasons for updating a cost-benefit analysis may include such factors as:

- Significant changes in projected costs and benefits
- Major changes in requirements (including legislative or regulatory changes)
- Empirical data based on performance measurements gained though prototype or pilot experience.

7.0 Proposed Implementation Schedule

7.1 Build a cross-reference table which lists courses in the curriculum on one axis (vertical or horizontal) and the recommended media option for each course or the other. Indicate estimated implementation dates on the table.

7.2 List any details for all course schedules.

7.3 Prepare detailed plan for media option selected.

Continued on next page

TRAINING PLAN, Continued

7.0 Proposed Implementation Schedule, (continued)

7.4 List resource requirements for conducting classes (i.e. how many PCs, software packages, user guides etc. must be available.

Training Implementation Schedule			
Media Option	**ACE For Beginners**	**Intermediate ACE**	**Advanced ACE**
Quick Ref. Card	9/5/97	----------	9/5/97
Quick Ref. Card	9/11/97	9/11/97	9/11/97
On Line Help	9/18/97	9/18/97	9/18/97
CBT Course	9/25/97	9/25/97	----------
Instructor-led Class	----------	10/2/97	10/2/97
Satellite Broadcast	10/9/97	----------	----------

8.0 Evaluation - Planned Field Follow-Ups

8.1 Effectiveness Study: Identify what and how training effectiveness will be determined.

8.2 Areas Requiring Additional Training: Identify anticipated ongoing training requirements.

8.3 Evaluation of Training/User Materials: Identify the types of feedback mechanisms that could be used to assess the effectiveness of the training materials to be used.

8.4 Satisfaction Survey: Determine whether any post training user satisfaction surveys will be used, and if so, when and what kind of feedback could be used.

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TRAINING PLAN, Continued

9.0 Detailed Deliverable Schedule

9.1 Provide a list of milestones and activities to be performed and the resources required against which cost and progress can be measured in order to meet the schedules implied by the preceding plan.

9.2 Identify Quality Assurance activities to be performed for these work products (includes training documentation, course materials, and services).

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